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Two new dictyosporous hyphomycetes on *Rhopalostylis sapida* (*Arecaceae*) in New Zealand

Eric H.C. McKenzie

mckenziee@landcareresearch.co.nz
Landcare Research, Private Bag 92170, Auckland, New Zealand

Abstract—*Dictyosporium hughesii* sp. nov. and *D. rhopalostylidis* sp. nov., found on dead leaves of the palm, *Rhopalostylis sapida* in New Zealand are illustrated and described and compared with related taxa.

Key words—anamorphic fungi, taxonomy

Introduction

The palm genus *Rhopalostylis* contains two taxa: *R. baueri* (endemic to Norfolk Island and to Raoul Island, Kermadec Islands) and the world's southern-most palm, *R. sapida* (endemic to mainland New Zealand). Palms are a favourable substrate for microfungi, and many species have been described from them (Taylor & Hyde 2003, McKenzie 2009). While examining dead leaf tissues of *R. sapida*, two new species of *Dictyosporium* were found. One of the new species (based on herbarium specimen PDD 20966) was previously recorded on *R. sapida* under the name *D. elegans* Corda (McKenzie et al. 2004).

Several species of *Dictyosporium* have been recorded on palms in various parts of the world. Of the 22 species of *Dictyosporium* accepted by Goh et al. (1999), eight (*D. alatum* Emden, *D. campaniforme* Matsush., *D. cocophylum* Bat., *D. digitatum* J.L. Chen et al., *D. elegans*, *D. heptasporum* (Garov.) Damon, *D. subramanianii* B. Sutton, *D. tetraseriale* Goh et al.) were listed on palms.

Materials and methods

Portions of leaf sheath from dead, fallen fronds of nikau palm (*Rhopalostylis sapida*) were collected from the forest floor. The plant material was incubated under humid conditions and periodically examined for sporulating microfungi. A dried herbarium specimen of a new *Dictyosporium* species was prepared and deposited in the New Zealand Fungal Herbarium (Herb. PDD). In addition, a specimen collected in 1963 and held in Herb. PDD under the name *D. elegans* was re-examined. Fungal fruiting structures were removed, mounted

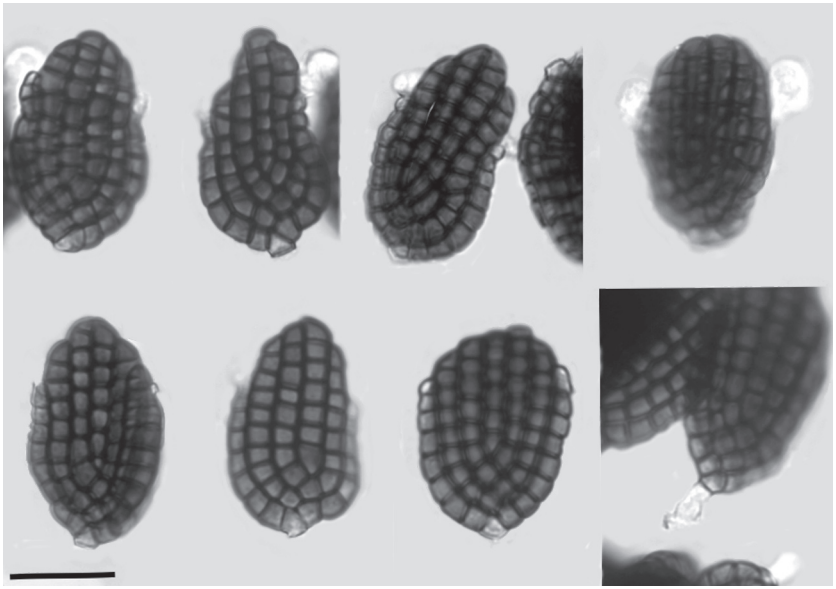

Fig. 1. Conidia of *Dictyosporium hughesii* (from holotype). Note apical appendages, especially on upper right conidium and conidiogenous cell attached to lower right conidium. Specimen mounted in hydrous lactophenol. Scale bar = 20 µm.

in lactophenol, and examined by light microscopy. Measurements were made on material mounted in lactophenol.

Taxonomy

Colonies of *Dictyosporium* are often in the form of compact sporodochia, but the genus is characterised by having micronematous conidiophores and conidia with orderly rows of cells arranged either flattened in one plane (complanate) or not flattened. The number of rows of cells is usually constant within a species. Goh et al. (1999) revised the genus *Dictyosporium* and provided a key to the species. A key was also provided by Cai et al. (2003) and most recently by Crous et al. (2009). Two specimens collected in New Zealand on dead leaves of *Rhopalostylis sapida* are distinct from hitherto known species of *Dictyosporium* and described below as *D. hughesii* and *D. rhopalostylidis*.

Dictyosporium hughesii McKenzie, **sp. nov.** Fig. 1

MycoBank: MB 515243.

Coloniae sporodochia, punctiformes, dispersae, pulvinatae, nigrae. Mycelium ex hyphis in substrato immersum, Conidiophora micronematosa, mononematosa, aseptata,

subhyalinae, tenuitunicata, laevia. Cellulae conidiogenae holoblasticae, determinatae, cylindricae, hyalinae, 3.5–5 µm latae. Conidia solitaria, sicca, acrogena, brunnea, laevia, complanata, ellipsoidea, cheiroidea, in 51–62 cellulis (6–)7-serietibus composita, constricta, (33–)40–47(–50) × (23–)25–30(–32) µm; cellula apicalis serietibus cum appendicibus subglobosa, hyalinis, usque ad 13 µm longa, 10 µm crassa, praedita.

Etymology: named after S.J. Hughes, doyen of New Zealand dematiaceous hyphomycete taxonomy.

Type: NEW ZEALAND, Auckland, Waitakere Ranges, Rangemore Track, in foliis mortuis arecacearum *Rhopalostylis sapida* H. Wendl. & Drude (*Arecaceae*), 8 May 1963, S.J. Hughes (PDD 20966, **holotype**).

Colonies with punctiform sporodochia, scattered but coalescing, black, irregular in shape. Mycelium immersed. Conidiophores reduced to conidiogenous cell, micronematous, mononematous, subhyaline, thin-walled, smooth. Conidiogenous cells holoblastic, determinate, cylindrical, 3.5–5 µm wide. Conidia solitary, dry, acrogenous, medium brown, concolourous, smooth-walled, complanate, ellipsoidal, cheiroid, consisting of 51–62 cells arranged in 7 closely adpressed rows arising from a 4.5–7 µm wide basal cell; basal cell typically rounded or diamond-shaped but sometimes truncate; inner rows extending the furthest, outer rows extending about two-thirds of the way along the conidium, each row containing 6–9 cells, constricted at septa, slightly thickened walls and septa, no pores visible on septa, (33–)40–47(–50) × (23–)25–30(–32) µm (mean = 43.7 × 27.8 µm, n = 30), apical cell of two outer rows sometimes become a swollen, out-curved, subglobose, hyaline appendage up to 13 µm long × 10 µm wide.

Comments: Twelve species of *Dictyosporium* have been described with conidia bearing variedly developed appendages (Crous et al. 2009). Of these, only the conidia of *D. musae* Photita (Photita et al., 2002) consistently comprise 7 rows of cells. However, the conidia of *D. musae* are smaller than those of *D. hughesii* (22–28 × 12.5–18 µm vs. 33–50 × 23–32 µm), not complanate, and the appendages arise from middle cells of the outer rows. *D. strelitziae* Crous & A.R. Wood is similar to *D. hughesii* in having complanate conidia with apical appendages on the outer rows. However, conidia of the former have predominantly only 5 rows of cells and measure 30–55 × 20–25 µm, while conidia of *D. hughesii* have 7 rows of cells and are wider. Appendages are evident on only a minority of the conidia of *D. hughesii*. This may be the natural condition, or it may be due to the age of the collection (almost 50 years old). Among those species of *Dictyosporium* that apparently lack appendages, *D. hughesii* keys out with *D. polystichum* (Höhn.) Damon and *D. toruloides* (Corda) Guég. (Crous et al. 2009). However, the number of rows of cells in the conidia of both of these species is irregular [(5–)7–9 rows in *D. polystichum* and (5–)6–8 rows in *D. toruloides*], and the rows are unequal in length reaching to markedly different heights of the conidium (Goh et al. 1999).

Taylor & Hyde (2003) recorded a *Dictyosporium* species, which they tentatively identified as *D. elegans* on a palm, *Archontophoenix alexandrae*, in Australia. Their specimen bore complanate conidia with 6–8 rows of cells (average 7), but the conidia measured 38–92 × 28–42 µm (mean 76 × 33.8 µm), which is considerably larger than the conidia of *D. hughesii*.

Dictyosporium rhopalostylidis McKenzie, **sp. nov.** Fig. 2

MycoBank: MB 515244.

Coloniae punctiformes, dispersae, pulvinatae, nigrae. Mycelium ex hyphis in substrato immersum, Conidiophora micronematosa, mononematosa, aseptata, subhyalinae, tenuitunicata, laevia. Cellulae conidiogenae holoblasticae, determinatae, cylindricae, pallide brunneae, 2–3 µm latae. Conidia solitaria, sicca, acrogena, brunnea, laevia, complanata, ellipsoidea, cheiroidea, in 30–40(–48) cellulis 5–6-serietibus composita, constricta, (28–)31–42(–48) × 20–27(–29) µm.

Etymology: named after the host plant, *Rhopalostylis sapida*.

Type: NEW ZEALAND, Wellington, Paraparaumu, Nikau Reserve, in foliis mortuis arecacearum *Rhopalostylis sapida* H. Wendl. & Drude (*Arecaceae*), 12 May 2009, E.H.C. McKenzie (PDD 97449, **holotype**).

Colonies with punctiform, sporodochial conidiomata, scattered, pulvinate, black, irregular in shape. *Mycelium* immersed. Conidiophores reduced to conidiogenous cell, micronematous, mononematous, subhyaline, thin-walled, smooth. Conidiogenous cells holoblastic, determinate, cylindrical, pale brown, 2–3 µm wide. Conidia solitary, dry, acrogenous, brown, concolourous, smooth-walled, complanate, ellipsoidal, cheiroid, consisting of 30–40(–48) cells arranged in 5–6 closely adpressed rows arising from a 4–5.5 µm wide basal cell, basal cell typically rounded or diamond-shaped but sometimes truncate, often with a small, persistent portion of the conidiogenous cell, each row reaching to more or less the same height, containing 5–10 cells, constricted at septa, slightly thickened walls and septa, no pores visible on septa, (28–)31–42(–48) × 20–27(–29) µm (mean = 35.2 × 28.5 µm, n = 30), each cell 3–5.5 µm long, 3.5–6 µm wide.

Comments: The conidia of *Dictyosporium rhopalostylidis* are morphologically similar to those of *D. elegans*, which has mostly 5 rows of cells. However, the conidia of *D. elegans* are larger, consisting of 51–96 cells and measuring (44–)50–80 × 24–31(–36) µm. In addition, the colonies of *D. elegans* are not in the form of sporodochia (Goh et al. 1999).

There are morphological similarities between *D. hughesii* and *D. rhopalostylidis*. However, the conidia of *D. hughesii* are slightly longer and composed of more cells, which are consistently arranged in 7 rows. The rows of cells in conidia of *D. rhopalostylidis* reach to approximately the same height, whereas in *D. hughesii* they extend to different heights. *Dictyosporium rhopalostylidis* also lacks the apical appendages found in *D. hughesii*.

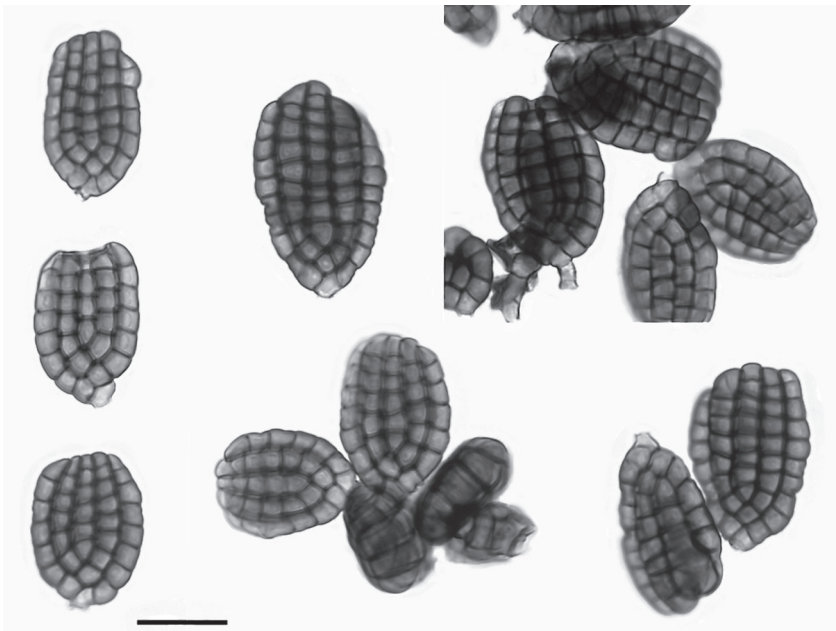

Fig. 2. Conidia of *Dictyosporium rhopalostylidis* (from holotype). Specimen mounted in hydrous lactophenol. Scale bar = 20 µm.

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